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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,850	06/25/2003	Eugene A. Fitzgerald	MIT9888	5524

7590 09/23/2004  
Attn: Matthew E. Connors  
Samuels, Gauthier & Stevens LLP  
Suite 3300  
225 Franklin Street  
Boston, MA 02110

EXAMINER

KESHAVAN, BELUR V

ART UNIT	PAPER NUMBER
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2825

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/603,850

Applicant(s)

FITZGERALD ET AL.

Examiner

Belur V Keshavan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-21 is/are rejected.
- 7) ☒ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/27/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-21 are rejected under 35 U.S.C. 102(a) as being anticipated by Fitzgerald et al. (PCT WO 02.15244 A2).

Regarding claims 1, 7, 8, Fitzgerald et al. disclose, in claims and in specification, a method of bonding lattice-mismatched semiconductors comprising; forming a Ge based virtual substrate (claim 1 and lines 1-5); depositing a CMP layer of silicon oxide which is an oxide and comprises silicon on the virtual substrate that is polished to form a planarized virtual substrate (on page 4, lines 24-25 and 34-35 and claim 4); bonding a silicon substrate to the planarized virtual substrate (claim 1 line 7 and page 4 lines 27-28); performing layer exfoliation on selective layers of the planarized virtual substrate producing a damaged layer of Ge and removing the damaged layer of Ge (claims 9, 10 and 11 and page 5 lines 33-34 and page 6 lines 2-3).

Regarding claim 3, Fitzgerald et al. disclose that virtual substrate comprises a III-V transfer layer in claim 13 and on page 7 line 28.

Regarding claim 12, Fitzgerald et al. disclose, in claims and in specification a method of bonding lattice-mismatched semiconductors comprising; forming a virtual substrate (claim 1 and lines 1-5); using the virtual substrate to form a planarized virtual substrate (on page 4, lines 24-25 and 34-35 and claim 4); bonding a silicon substrate to the planarized virtual substrate (claim 1 line 7 and page 4 lines 27-28); and bonding a silicon substrate to the planarized virtual substrate (claim 1 line 7 and page 4 lines 27-28) and removing selective layers of the planarized

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virtual substrate associated with the virtual substrate (claims 9,10 and 11 and page 5 lines 33-34 and page 6 lines 2-3).

Regarding claim 14, Fitzgerald et al. disclose that virtual substrate comprises a III-V transfer layer in claim 13 and on page 7 line 28.

Regarding claim 18, wherein the planarized virtual substrate is formed using oxide (on page 4, lines 24-25 and 34-35 and claim 4);

Regarding claim 19, wherein the planarized virtual substrate is formed using  $\text{Si}_{1-x}\text{Ge}_x$  (in claim 1 and page 7 and lines 4-5)

Regarding claims 2, 4, 5, 6, 9, 10,11, 13, 15, 16, 17, 20 and 21, the added "limitations" contained therein have not been given significant patentable weights as these method claims only provide statements of intended use of the layer or composition material of the layer and not any additional method step.

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Belur V Keshavan whose telephone number is 571-272-1894. The examiner can normally be reached on 8-4:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BVK. *BVK*  
September 15, 2004.

Belur V. Keshavan.  
Examiner. Art Unit 2825.

*Matthew Smith*  
MATTHEW SMITH  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800